

One x One Degree
Climate Change Atlas Tree Species
 Current and Potential Future Habitat, Capability, and Migration

Area of Region sq. km sq. mi FIA Plots
 9,130.7 3,525.4 196

Species Information

The columns below provide brief summaries of the species associated with the region and described in the table on the next pages. Definitions are provided in the Excel file for this region.

Genus	Species	Abundance		Model		Potential Change in Habitat Suitability		Capability to Cope or Persist		Migration Potential					
				Reliability	Adaptability	Scenario RCP45	Scenario RCP85	Scenario RCP45	Scenario RCP85	SHIFT RCP45	SHIFT RCP85				
Ash	3			High	22	21	Increase	21	22	Very Good	4	6	Likely	2	2
Hickory	4			Medium	26	44	No Change	9	7	Good	15	16	Infill	11	11
Maple	7	Abundant	4	Low	29	14	Decrease	26	27	Fair	14	8	Migrate	4	10
Oak	6	Common	23	FIA	5		New	18	18	Poor	8	11			
Pine	7	Rare	34				Unknown	8	8	Very Poor	8	5			
Other	34	Absent	20							FIA Only	2	2			
	61		81		82	79		82	82	Unknown	3	3			
											54	51			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	46.6	48.5	51.0	51.1	
Average	CCSM85	46.6	49.0	51.6	54.8	
	GFDL45	46.6	50.4	52.8	54.0	
	GFDL85	46.6	50.1	54.1	58.7	
	HAD45	46.6	49.7	53.1	54.8	
	HAD85	46.6	49.8	54.1	59.6	
Growing Season	CCSM45	63.5	65.6	67.6	68.0	
	CCSM85	63.5	65.8	68.3	72.3	
May—Sep	GFDL45	63.5	67.8	70.8	72.4	
	GFDL85	63.5	67.9	72.4	77.3	
	HAD45	63.5	66.9	69.7	72.2	
	HAD85	63.5	66.5	71.4	77.5	
Coldest Month	CCSM45	20.5	22.6	24.8	24.8	
	CCSM85	20.5	23.6	24.8	27.0	
Average	GFDL45	20.5	23.5	25.3	26.0	
	GFDL85	20.5	24.1	25.8	28.2	
	HAD45	20.5	22.3	25.5	25.6	
	HAD85	20.5	23.8	26.2	29.6	
Warmest Month	CCSM45	69.5	71.8	73.0	73.3	
	CCSM85	69.5	72.2	73.9	76.1	
Average	GFDL45	69.5	72.4	74.9	75.9	
	GFDL85	69.5	73.8	76.4	79.4	
	HAD45	69.5	73.3	74.9	76.8	
	HAD85	69.5	73.4	76.5	81.0	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	38.5	38.4	37.6	40.9	
Total	CCSM85	38.5	39.3	39.8	40.6	
	GFDL45	38.5	42.4	43.9	43.1	
	GFDL85	38.5	40.0	43.1	44.8	
	HAD45	38.5	39.7	41.0	40.1	
	HAD85	38.5	40.6	39.4	43.2	
Growing Season	CCSM45	18.6	18.5	17.8	19.3	
	CCSM85	18.6	18.5	18.6	17.7	
May—Sep	GFDL45	18.6	19.5	18.9	18.8	
	GFDL85	18.6	18.5	18.4	18.1	
	HAD45	18.6	19.0	17.6	18.0	
	HAD85	18.6	18.5	17.1	18.4	

NOTE: For the six climate variables, four 30-year periods are used to indicate six potential future trajectories. The period ending in 2009 is based on modeled observations from the PRISM Climate Group and the three future periods were obtained from the NASA NEX-DCP30 dataset. Future climate projections from three models under two emission scenarios show estimates of each climate variable within the region. The three models are CCSM4, GFDL CM3, and HadGEM2-ES and the emission scenarios are the 4.5 and 8.5 RCP. The average value for the region is reported, even though locations within the region may vary substantially based on latitude, elevation, land-use, or other factors.

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
sugar maple	Acer saccharum	WDH	High	73.9	1340.6	16.5	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
white ash	Fraxinus americana	WDL	Medium	76.2	1081.5	12.1	No change	Sm. dec.	Low	Abundant	Fair	Fair			0	2
red maple	Acer rubrum	WDH	High	63.9	907.0	10.8	No change	No change	High	Abundant	Very Good	Very Good			1	3
eastern white pine	Pinus strobus	WDH	High	40	628.7	12.8	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	4
black cherry	Prunus serotina	WDL	Medium	51.2	387.5	6.2	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	5
eastern hemlock	Tsuga canadensis	NSH	High	35.9	359.5	7.5	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	6
American beech	Fagus grandifolia	WDH	High	52	353.8	5.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	7
northern red oak	Quercus rubra	WDH	Medium	41	301.1	7.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	8
green ash	Fraxinus pennsylvanica	WSH	Low	16.3	247.6	22.3	No change	Sm. inc.	Medium	Common	Fair	Good			1	9
American basswood	Tilia americana	WSL	Medium	44.9	226.0	5.8	No change	No change	Medium	Common	Fair	Fair			1	10
quaking aspen	Populus tremuloides	WDH	High	29.7	222.3	6.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	11
black locust	Robinia pseudoacacia	NDH	Low	13.9	176.9	11.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
silver maple	Acer saccharinum	NSH	Low	10.7	156.6	20.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	13
American elm	Ulmus americana	WDH	Medium	28	137.3	3.3	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	14
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	50.2	132.1	3.2	No change	No change	High	Common	Good	Good			1	15
bitternut hickory	Carya cordiformis	WSL	Low	23.2	122.8	6.6	Sm. dec.	Sm. inc.	High	Common	Fair	Very Good			1	16
red pine	Pinus resinosa	NSH	Medium	9.1	113.1	11.3	Very Lg. dec.	Very Lg. dec.	Low	Common	Lost	Lost			0	17
sweet birch	Betula lenta	NDH	High	24.6	97.5	3.2	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	18
Scots pine	Pinus sylvestris	NSH	FIA	6.3	91.9	10.4	Unknown	Unknown	NA	Common	NNIS	NNIS			0	19
black oak	Quercus velutina	WDH	High	7.3	87.0	9.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	20
black willow	Salix nigra	NSH	Low	13.1	84.0	14.6	Lg. dec.	Sm. dec.	Low	Common	Very Poor	Poor			0	21
bigtooth aspen	Populus grandidentata	NSL	Medium	20.2	79.2	3.5	No change	Lg. dec.	Medium	Common	Fair	Poor			1	22
shagbark hickory	Carya ovata	WSL	Medium	30.5	79.0	4.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
Norway spruce	Picea abies	NSH	FIA	10.5	71.3	6.7	Unknown	Unknown	NA	Common	NNIS	NNIS			0	24
eastern cottonwood	Populus deltoides	NSH	Low	7.4	69.6	11.1	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	25
boxelder	Acer negundo	WSH	Low	7.2	64.7	14.2	No change	No change	High	Common	Good	Good			1	26
yellow birch	Betula alleghaniensis	NDL	High	15.4	60.2	3.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	27
pignut hickory	Carya glabra	WDL	Medium	19.2	45.9	5.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	28
American hornbeam; musclev	Carpinus caroliniana	WDL	Low	33	44.4	1.4	No change	No change	Medium	Rare	Poor	Poor			1	29
white oak	Quercus alba	WDH	Medium	11.1	43.6	3.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	30
chestnut oak	Quercus prinus	NDH	High	4.1	43.3	6.6	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	31
sycamore	Platanus occidentalis	NSL	Low	3.5	39.1	6.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	32
black walnut	Juglans nigra	WDH	Low	13.2	37.5	3.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	33
red spruce	Picea rubens	NDH	High	3.3	28.2	8.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	34
paper birch	Betula papyrifera	WDH	High	3.1	23.3	2.7	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	35
pitch pine	Pinus rigida	NSH	High	6.9	18.7	4.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	36
eastern redcedar	Juniperus virginiana	WDH	Medium	5.2	18.4	4.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	37
bur oak	Quercus macrocarpa	NDH	Medium	5.8	17.3	5.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	38
striped maple	Acer pensylvanicum	NSL	Medium	8.6	17.2	1.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
serviceberry	Amelanchier spp.	NSL	Low	12.8	16.9	0.9	Sm. inc.	No change	Medium	Rare	Fair	Poor			1	40
northern white-cedar	Thuja occidentalis	WSH	High	2.6	15.9	2.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
pin cherry	Prunus pensylvanica	NSL	Low	3.2	15.0	1.5	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	42
white spruce	Picea glauca	NSL	Medium	8.5	14.4	4.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	43
chokecherry	Prunus virginiana	NSLX	FIA	8.3	12.5	1.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	44
butternut	Juglans cinerea	NSLX	FIA	1.7	11.0	4.6	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	45
jack pine	Pinus banksiana	NSH	Medium	1.1	9.7	8.9	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	46
tamarack (native)	Larix laricina	NSH	High	1.1	5.0	4.6	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	47



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yellow-poplar	Liriodendron tulipifera	WDH	High	6.3	3.7	1.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	48
blackgum	Nyssa sylvatica	WDL	Medium	1.1	3.4	3.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	49
Norway maple	Acer platanoides	NSL	FIA	4.8	3.0	2.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	50
cucumber tree	Magnolia acuminata	NSL	Low	2.2	2.7	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
gray birch	Betula populifolia	NSL	Low	2.1	2.6	0.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	52
black ash	Fraxinus nigra	WSH	Medium	1.1	2.5	2.3	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	53
sassafras	Sassafras albidum	WSL	Low	2.2	2.4	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	54
Virginia pine	Pinus virginiana	NDH	High	1.3	2.2	0.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	55
balsam fir	Abies balsamea	NDH	High	1.1	1.7	1.5	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	56
mountain maple	Acer spicatum	NSL	Low	0.8	1.6	1.1	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	57
swamp white oak	Quercus bicolor	NSL	Low	7.4	1.6	2.4	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	58
Table Mountain pine	Pinus pungens	NSL	Low	1.1	1.1	1.0	Lg. dec.	Very Lg. dec.	High	Rare	Poor	Lost			0	59
mockernut hickory	Carya alba	WDL	Medium	1.1	0.5	0.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	60
flowering dogwood	Cornus florida	WDL	Medium	1.1	0.5	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	61
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	62
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	63
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	64
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	65
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	66
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	67
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	68
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	69
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	70
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	71
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	72
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	73
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	74
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	75
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	76
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	77
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	78
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	79
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	80
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	81
slippery elm	Ulmus rubra	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	82